



RESEARCH ARTICLE - ANTS

A New Species of the Ant Genus *Dolichoderus* Lund, 1831 (Hymenoptera: Formicidae) from Thailand

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Article History

Edited by

Himender Bharti, PUP, India

Received 18 February 2021

Initial acceptance 01 December 2021

Final acceptance 07 January 2022

Publication date 07 February 2022

Keywords

Ant, *Dolichoderus bakhtiari*, new species, species group, distribution, Thailand.

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Abstract

Dolichoderus Lund, 1831 is one of the large ant genera in the world and belongs to the subfamily Dolichoderinae. Currently, 130 species and 19 subspecies are known in this genus. A new species of the *Dolichoderus thoracicus* species group, *Dolichoderus bakhtiari* sp. nov. is here described based on the worker caste. The type series of the new species was collected from shrub trees in a primary upland evergreen forest (ca. 800 m a.s.l.). A key to the Thai *D. thoracicus* species group is provided.

urn:lsid:zoobank.org:pub:EE659CB6-1D48-45B3-A026-D8F01A0E4120

Introduction

Dolichoderus Lund, 1831 is a large dolichoderine genus of the tribe Dolichoderini (Bolton, 2003). Members of the genus are distributed worldwide except in the Afrotropical and Malagasy regions (Bolton, 1995, 2003; Shattuck & Marsden, 2013; Antweb, 2021). In general, workers of some species are active day and night, and regarding feeding behavior they are scavengers scavengers as well as tending aphids and other Hemiptera for honeydew. They often forage in columns on the ground or lower vegetation and trees. Most species are arboreal, sometimes using plant fibre to form coverings during nest construction (Shattuck & Marsden, 2013). In our field surveys, we observed herds of *Dolichoderus cuspidatus* workers surrounding small tree branches and sometimes on ropes tied to wooden trunks in forest alleys to escape from wet during the rainy season.

A total of 130 species and 19 subspecies are recognized in the genus (AntCat, 2021). Among them, about 32 species and 21 subspecies have been recorded from Southeast Asia. Thirteen species are known from Thailand in four species groups: *D. cuspidatus*, *D. scabridus*, *D. sulcaticeps* and *D. thoracicus* species groups (Dill, 2002; Khachonpisitsak et al., 2020). Of these, five species belong to the *D. thoracicus* species group: *Dolichoderus affinis* Emery, 1889; *Dolichoderus butteli* Forel, 1913; *Dolichoderus brevis* Santschi, 1920; *Dolichoderus taprobanae* Smith, 1858 and *Dolichoderus thoracicus* (Smith, 1860). Among these species, *D. taprobanae* was described based on the queen and we must recognize the worker of this species.

Based on the present study of Southeast Asian *Dolichoderus*, we found a new species of the *D. thoracicus* species group from Thailand, described based on the worker caste. A list of extant species and subspecies of the *D. thoracicus* species group is provided (Table 1).



Materials and methods

Holotype and paratypes of *Dolichoderus bakhtiari* sp. nov. were point-mounted and gyne and male are not reported. We compared dealate and alate queens of *Dolichoderus taprobanae* collected from Thailand with the high-resolution images of the *D. taprobanae* holotype (alate queen) available on Antweb (2021). The type specimens of the new species were compared with workers from the colonies from Thailand to which the dealate and alate queens belonged. The high-resolution images of the syntypes of *Dolichoderus semirufus* (junior synonym of *D. taprobanae*), *Hypoclinea gracilipes* (junior synonym of *D. taprobanae*), *Dolichoderus taprobanae tonkina* (subspecies of *D. taprobanae*), and *Dolichoderus taprobanae siamensis* (subspecies of *D. taprobanae*) which are available on Antweb (2021) were also examined.

Taxonomic analysis was made with a ZEISS Discovery V12 stereoscope. Multi-focused montage images were produced using NIS-Elements-D from a series of source images taken with the Nikon Digital Sight-Ri1 camera

attached to a Nikon AZ100M stereoscope. The holotype and ten paratypes were measured for the following parts using a micrometer (accurate to 0.01 mm).

The abbreviations used for the measurements and indices are as follows:

TL Total length of the body, length of the body's long axis from the anteriormost point of the anterior clypeal margin to the posteriormost point of the gaster (measurements of specimens that were not straightened out are composed of HL+MSL+PL+length of gaster).

HL Maximum head length in full-face view, measured from the anterior clypeal margin to the midpoint of a line down across the posterior margin of head.

HW Maximum head width in full-face view.

MdL Mandible length. With head in full-face view, length of mandible measured along outer margin, the chord distance from lateral insertion to mandible apex.

SL Scape length excluding the basal of constriction and condylar bulb.

Table 1. List of the Southeast Asian species and subspecies of the *Dolichoderus thoracicus* species group.

Species	Distributions (* = Type localities)
1. <i>D. affinis</i> Emery, 1889	India, China, Myanmar*, Vietnam, Laos, Thailand, Malaysia (Borneo), Indonesia and Philippines
2. <i>D. affinis glabripes</i> Forel, 1895	India*
3. <i>D. affinis mus</i> Santschi, 1920	Vietnam*
4. <i>D. brevis</i> Santschi, 1920	Laos* and Thailand
5. <i>D. burmanicus</i> Bingham, 1903	Myanmar*
6. <i>D. butteli</i> Forel, 1913	Thailand, Malaysia, Singapore and Indonesia (Sumatra*)
7. <i>D. carbonarius</i> Emery, 1895	Malaysia (Malay Peninsular*)
8. <i>D. carbonarius latisquamis</i> Emery, 1900	Indonesia (Sumatra*)
9. <i>D. gibbus</i> (Smith, 1861)	Indonesia (Sulawesi*)
10. <i>D. lactarius</i> (Smith, 1860)	Indonesia (Maluku Islands*)
11. <i>D. moggridgei</i> Forel, 1886	Afghanistan, China (Yunnan) and India (Assam*)
12. <i>D. moggridgei bicolor</i> Santschi, 1920	India (Sikkim*)
13. <i>D. taprobanae</i> (Smith, 1858)	Pakistan, Nepal, Bhutan, India, Sri Lanka*, Bangladesh, China, Vietnam, Laos, Thailand, Malaysia (Borneo) and Indonesia (Sumatra)
14. <i>D. taprobanae borneensis</i> Forel, 1911	Malaysia (Borneo*) and Indonesia (Sumatra)
15. <i>D. taprobanae ceramensis</i> Stitz, 1912	Indonesia (Maluku Islands*)
16. <i>D. taprobanae friedrichsi</i> Forel, 1914	Vietnam*
17. <i>D. taprobanae gracilipes</i> (Mayr, 1879)	India*, Sri Lanka, China, Myanmar, Vietnam, Malaysia (Borneo), and Indonesia (Sumatra)
18. <i>D. taprobanae siamensis</i> Forel, 1911	Vietnam and Thailand*
19. <i>D. thoracicus</i> (Smith, 1860)	India, Sri Lanka, China, Vietnam, Cambodia, Laos, Thailand, Malaysia, Singapore, Indonesia* and Philippines
20. <i>D. thoracicus bilikanus</i> Santschi, 1925	Indonesia (Sumatra*)
21. <i>D. thoracicus borneonensis</i> (Roger, 1863)	Malaysia (Borneo*) and Indonesia (Sumatra)
22. <i>D. thoracicus emarginatus</i> Santschi, 1920	Vietnam*
23. <i>D. thoracicus lacciperdus</i> Santschi, 1925	Cambodia*
24. <i>D. thoracicus levior</i> Karavaiev, 1926	Indonesia (Sumatra*)
25. <i>D. thoracicus nasutus</i> Karavaiev, 1935	Cambodia*
26. <i>D. thoracicus rufescens</i> Stitz, 1925	Malaysia (Borneo*) and Indonesia

ML Mesosomal length measurement from the point at which the pronotum meets the cervical shield to the posterior margin of metapleuron in profile.

PL Petiole length measurement from anterior margin to posterior-most point of petiolar in profile view.

PH Height of petiole in profile measurement as the perpendicular distance from the apex of the petiolar process to a line tangent to the dorsal-most point of a node.

DPW Dorsal petiole width. Maximum width of the petiolar node in dorsal view.

CI Cephalic Index. $HW/HL \times 100$.

MdI Mandibulo-cephalic Index. $MdL \times 100/HL$.

OI Ocular Index. $ED \times 100/HW$.

SI Scape Index. $SL/HW \times 100$.

Abbreviations of the type depositories are as follows:

THNHM Thailand Natural History Museum of National Science Museum Thailand

SKYC Seiki Yamane's Collection at Kitakyushu Museum of Natural History and Human History, Japan

Results

Dolichoderus thoracicus species group

Dill (2002) defined the worker caste of this species group as follows: small to moderately sized species (HW 0.59–1.25 mm, TL 3.0–4.5 mm); variable coloration and sculpturing; head, mesosoma, and gaster sparsely to densely pilose, mostly pubescent; scape usually with short erect hairs, longest hairs shorter than the maximum width of scape; antenna moderately long (SI 71–114); flagellomeres void of erect hairs; in full-face view, posterior margin of head concave emarginate; head about as long as broad; mesosoma unarmed;

mesonotum round and only moderately vaulted; propodeum mostly distinctly narrower than pronotum; propodeum mostly somewhat rising, its declivitous face varying from not to distinctly concave, its rising dorsal face always with erect hairs; petiole scale in dorsal view mostly compressed, i.e. distinctly broader than long; its dorsal margin usually emarginate.

Dolichoderus bakhtiari Barabag & Jaitrong sp. nov. (Fig 1)

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Types. Holotype worker (THNHM-I-22732, THNHM), NE Thailand, Nakhon Ratchasima Province, Pak Chong District, Moo Sri Subdistrict, 9. II. 2020, W. Khaikaew leg., from a colony (WK090220-01). Paratypes: 32 workers (THNHM-I-22733 to THNHM-I-22764), same data as holotype (SKYC, THNHM).

Measurements: Holotype: TL 3.20, HL 0.79, HW 0.73, EL 0.17, MdL 0.30, SL 0.76, ML 0.96, PL 0.23, PH 0.33, DPW 0.23, CI 92, OI 23, MdI 38, SI 105. **Paratypes** (n = 10): TL 3.14–3.63, HL 0.73–0.79, HW 0.69–0.76, EL 0.13–0.17, MdL 0.26–0.33, SL 0.69–0.76, ML 0.89–0.99, PL 0.23–0.26, PH 0.26–0.33, DPW 0.20–0.26, CI 91–96, OI 19–23, MdI 35–43, SI 100–105.

Worker diagnosis: Body entirely yellowish to reddish; entire head and mesosoma covered with fine erect hairs; sparse dark spots present over dorsum of head; with mesosoma in lateral view mesonotum strongly convex with steep posterior slope, nearly as high as propodeum; propodeum dorsally weakly convex with rather a flat dorsum and blunt posterior angle; metanotal groove deeply and broadly incised.

Description of worker (holotype and paratypes):

Structure. Head in full-face view, oval, slightly



Fig 1. *Dolichoderus bakhtiari* sp. nov. holotype worker, THNHM-I-22732. A) head in full-face view, B) habitus in profile view, C) habitus in dorsal view.

longer than broad (CI 91–96); posterior margin weakly convex and shallowly emarginate medially, lateral margin convex; eye relatively large, located anterior to midlength of head laterally, with 14–15 ommatidia along the longest axis; antennal scape long (SI 100–105), scape extending posteriorly slightly beyond the posterolateral corner of head; pedicel and flagellomeres longer than broad; antennal segment XII almost as long as segments X and XI combined; mandible subtriangular; masticatory margin with sharp apical tooth followed by 11–12 smaller teeth, and basal margin straight with 4–5 small denticles; frontal lobe narrow covering the antennal socket; frontal carina short, reaching half-length of head; clypeus broad, with anterior margin almost straight but feebly concave medially; mesosoma in profile pronotum dorsally flat, mesonotum convex and steeply sloping to metanotal groove; in dorsal view, mesonotum with shallow longitudinal groove; in profile view propodeum weakly convex; propodeal junction right-angled; mesopleuron demarcated from metapleuron by distinct groove, anterior margin of mesopleuron forming sharp triangle; metapleuron not clearly demarcated from lateral face of propodeum; petiole scale-like, convex dorsally and elevated anteriorly, anterior margin shorter than the posterior margin; legs relatively long (compared with other smaller species such as *D. taprobanae*).

Sculpture. Head entirely superficially reticulate with slightly smooth and shiny interspaces; pronotum mostly punctate but slightly shiny; mesonotum, mesopleuron, and dorsal face of propodeum irregularly rugulose and punctate; metapleuron mostly smooth and shiny; petiole smooth and shiny; gaster superficially reticulated with smooth and shiny interspaces; coxae and femora superficially reticulated with

smooth and shiny interspaces; tibiae are finely micropunctate.

Pilosity and coloration. Dorsal surface of head, mesosoma, and gaster covered with dense short white decumbent hairs mixed with dense brown erect hairs; longest erect hair on pronotum about three times as long as erect hairs on gastral tergites; legs with short suberect hairs; entire body yellowish brown with sparse dark spots on the head dorsum.

Etymology. The specific name is dedicated to the late Dr. Bakhtiar Effendi Yahya, who worked on the taxonomy of Malaysian ants between the years 2000–19.

Distribution. Thailand (Nakhon Ratchasima Province).

Bionomics. The type series foraged on leaves of shrub trees (Fig 3) in a primary upland evergreen forest at about 800 m a.s.l. in Nakhon Ratchasima Province, Northeastern Thailand.

Remarks. *Dolichoderus bakhtiari* sp. nov. is most similar to *Dolichoderus taprobanae* in general appearance as they share some common characters like reddish to yellowish body color; head microreticulate with smooth and shiny interspaces; relatively small body size; dorsally flat pronotum; nearly right-angled propodeal junction. However, *D. bakhtiari* sp. nov. can be easily separated from *D. taprobanae* by the following combination of characters: body larger in size (TL 3.14–3.63 mm, HL 0.73–0.79 mm, HW 0.6–0.76 mm); head slightly longer than broad; body entirely yellowish-brown; dorsal outline of propodeum weakly convex; lateral face of pronotum relatively smooth with more developed of frontal carinae. While in *D. taprobanae* body smaller in size (TL 2.51–2.93 mm, HL 0.66–0.69 mm, HW 0.49–0.52 mm); head slightly shorter than broad; vertex of head and gaster dark brown; dorsal outline of propodeum straight; lateral face of pronotum punctate with less developed of frontal carinae. Here, the *D. taprobanae* images are attached for comparison (Fig 2).



Fig 2. *Dolichoderus taprobanae* worker (Colony number WJT06-N6, 27.V.2006). A) head in full-face view, B) habitus in profile view, C) habitus in dorsal view.



Fig 3. Workers of the new species forage on a leaf of a shrub tree.

Key to the Thailand *Dolichoderus thoracicus* species group

- 1 Head densely and finely rugulose or punctured; dorsa of head, mesosoma, and gaster with dense pubescence and standing hairs; larger species (HW > 0.90 mm).....2
 - Head superficially reticulate or smooth and shiny; dorsa of head, mesosoma, and gaster with sparse pubescence and standing hairs; smaller species (HW < 0.80 mm)..... 3
- 2 Propodeal junction sharply angulated; dorsal outline of propodeum almost straight.....*Dolichoderus affinis*
 - Propodeal junction bluntly angulated; dorsal outline of propodeum convex.....*Dolichoderus thoracicus*
- 3 Mesosoma foveolate..... 4
 - Mesosoma punctured, not foveolate.....5
- 4 Propodeal junction sharply angulated; dorsal outline of propodeum straight; pronotum flat..... *Dolichoderus butteli*
 - Propodeal junction bluntly angulated; dorsal outline of propodeum convex; pronotum convex.....*Dolichoderus brevis*
- 5 Larger species (TL 3.14–3.63 mm, HL 0.73–0.79 mm, HW 0.6–0.76 mm); head slightly longer than broad; body entirely yellowish-brown; dorsal outline of propodeum weakly convex; lateral face of pronotum relatively smooth with more developed of frontal carinae.....*Dolichoderus bakhtiari* sp. nov.
 - Smaller in size (TL 2.51–2.93 mm, HL 0.66–0.69 mm, HW 0.49–0.52 mm); head slightly shorter than broad; vertex of head and gaster dark brown; dorsal outline of propodeum straight; lateral face of pronotum punctate with less developed of frontal carinae..... *Dolichoderus taprobanae*

Acknowledgments

We thank the Thailand Museum of Natural History of the Thailand National Science Museum for allowing Z. Barabag to use facilities and to examine ant specimens. The authors also thank Mr. W. Khaikaew who donated us the type series. This project is supported by the University Malaysia Sabah Postgraduate Research Grant (GUG0268-2/2018), the Malaysia Ministry of Education Scholarship, and partly by Thailand Science Research and Innovation. We would like to thank Seiki Yamane and Liew Thor Seng for their constructive comments on the manuscript.

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